LEVERAGED BUYOUTS: AN ANALYSIS OF RETURNS TO BONDHOLDERS AND STOCKHOLDERS

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Scope of Study: This study investigates the abnormal security returns, if any, when a leveraged buyout proposal is announced. Abnormal returns for a period of 61 days surrounding the announcement date for stocks and 22 days for bonds are analyzed. The stock data is obtained from the Center for Research in Security Prices (CRSP) tape and the Bond data from The Wall Street Journal . Three hypotheses with regard to affect of leveraged buyouts on stocks and bonds were analyzed.

Findings of the Study: The common stockholders tend to gain by the announcement of a leveraged buyout while the bondholders lose as seen in the announcement period. The results are consistent with the belief that the party engaging in leveraged buyouts share the gains that they expect to realize from leveraged buyouts with the stockholders. It also appears that part of these gains come at the expense of bondholders.

LEVERAGED BUYOUTS: AN ANALYSIS OF RETURNS

TO BONDHOLDERS AND STOCKHOLDERS

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

A leveraged buyout (LBO) is an acquisition of a company, to take it private which leaves the acquired operating entity with a greater than traditional debt to worth ratio, or a method of utilizing others' assets (in the form of debt or equity) in an effort to produce a disproportionate increase in one's own investment and, coincidently, overall worth. This paper examines the effect of LBOs on the target firms' securities.

An LBO involves leveraging (borrowing) from a financing source to acquire the target company. The proceeds are used to pay the seller. Internal cash flow and/or assets redeployment are used to retire the debt. An LBO may also signal information about firm's value to investors. As a result, security price changes associated with an LBO can result from several or combination of factors. We attempt to identify some of the dominant factors underlying the observed value changes.

An examination of leveraged buyouts provides evidence that has implications on several other issues like the effect of altering a firm's investment and/or financing decisions, the means by which new information is disseminated to investors and the conflict of interest between a firm's stockholders and the holders of other classes of securities.

The next section of the paper describes the basic features and institutional arrangements of the principal ways in which LBOs are initiated. In section 3, explanation of the various hypotheses are presented. Section 4 describes the sample of LBO firms and the principal

sources of data. The empirical analysis of the impact of LBOs is presented in section 5 and section 6 summarizes the results of this investigation.

2. METHODS OF LEVERAGED BUYOUTS

An LBO is accomplished primarily by utilizing the purchased assets for collateral and the acquired earning stream to amortize the debt. The investment goal of an LBO is usually to buy right to a company, leverage to the maximum safe limit, and then resell or go public in three to five years with a commensurate three to five times return on equity invested (Garguilo (1982)).

The terms of purchase are usually all cash or cash and notes to the seller. However, the sellers sometimes participate by becoming equity owners in the acquiring corporation. The purchaser's capital investment usually represents only a small portion of the purchase price and the balance of the purchase price is supplied by third-party lenders or equity sources.

The companies purchased, two to three years ago, were usually undervalued, slow growing companies in basic manufacturing industries where the company's solid assets (e.g. machinery) were used to secure debt. But now this structure has completely changed to include higher price/earnings ratio companies offering lower premiums over the market. This has been possible because assets are no longer the primary form of collateral and lenders put up money nowadays based on strong management, solid cash flow, and product viability.

The sellers are large stockholders of companies who sell for a desire for liquidity, estate considerations, retirement or sickness, and

corporations seeking to spin off assets that no longer fit corporate product-line strategies or meet the parent's financial criteria of growth or return on investment(ROI). The buyers include entrepreneurs, incumbent management teams, investors/managers, corporations, and investment bankers acting either as agents and/or investors. The subordinate lenders are typically venture capital firms and insurance companies and the secured lenders are primarily the commercial banks and commercial finance companies.

The ownership structure of the newly private firm is designed both to protect the interests of parties that have supplied capital in the buyout and to improve the incentives and performance of a management group which generally stays with the company. Mostly being initiated by the management group, the method of financing in an LBO depends upon the management group's initial equity ownership and collateral available. But a large part of financing is provided by some combination of subordinate debt--generally with an equity kicker--and senior debt--generally owing to banks aggregating to the total purchase price. The structure of credit in an LBO will always fall into one of the following quadrants.

Figure 1

		Type of Financing	
		Secured	Unsecured
Type of Transaction	Asset Acquisition		
	Stock Acquisition		

Secured financing is when the assets of the bought company are used to collatralize the debt and unsecured financing consists of a combination of venture capital (subordinate and/or senior debt). Asset acquisition refers to the formation of a new company to acquire the assets of the target company while stock acquisitions may be done in many ways. These may include stock redemption, pure stock acquisitions, tender offers and reverse mergers.

Junk bonds are increasingly being used to affect an LBO. Though these debt securities with ratings lower than investment grade, are hardly a new phenomenon, their recent use has generated a lot of criticism. Complaints about the bonds include charges that they are being used to create excessive leverage in the economy, that they are bought for unsound reasons by some of the prominent players in the takeover field, and that they threaten large and established companies with takeovers by smaller raiders unable to obtain financing from more traditional sources.

Another development in LBOs is the use of Employee Stock Ownership Plans (ESOP). In such a buyout, the funds are borrowed in the name of the ESOP and the ESOP is made to subscribe to an equivalent amount of common stock of the new firm. As the ESOP repays the principal plus interest on the loan from the tax-deductible contributions made to it by the firm it obtains title to the common stock. Thus the ESOP, which usually is in the trust and control of management, eventually becomes the principal owner of the new firm. The employees' risk position deteriorates, however, since they have now become severely underdiversified. The major advantage of ESOP thus being that not only

the interest but also the principal payments on the debt become deductible from taxable income. This makes ESOP loans more attractive to bankers.

3. STATEMENT OF VARIOUS HYPOTHESES AND RELATED EVIDENCE

3.1 Transaction Costs Hypothesis

An announcement that a firm is to be acquired and taken private and the resulting elimination of costs associated with public ownership should produce an increase in the firm's value. The potential percentage gains to existing stockholder's by the acquisition is equal to the capitalized cost of public ownership divided by the market value of the firm's common stock (DeAngelo, DeAngelo and Rice (DDR) (1984)) . Assuming that the cost of public ownership is a fixed cost and is independent of firm size, it may be argued that this cost is constant *across our sample. If this assumption* holds, the potential percentage gains from a buyout should be lower for larger firms and vice versa (Travlos and Millon (1985)). However, Gunay (1985) argues that since the LBOs involve a very large sum of money, it appears unlikely that transaction costs savings are a major source of gains in a buyout though it is possible for very small firms. These competing propositions can be tested by examining the relationship between size of the firm and the magnitude of their announcement period abnormal returns. A negative relation among the two implies that the elimination of transaction costs is a major determinant of any abnormal returns found at announcement, but a positive or no relationship leads to a conclusion that transaction costs reduction is not a dominant factor explaining the abnormal returns. Travlos and Millon (1985) test the transaction cost hypothesis in the

case of LBOs but they rule out the hypothesis as a dominant factor motivating firms to go private as no systematic pattern is demonstrated by the portfolio returns, i.e. between abnormal returns and market value.

The test we use in our hypothesis test is done in a similar fashion as done by Travlos and Millon (1985) though we have a different sample.

3.2 Agency Cost Hypothesis

There are at least two possible sources of reduction in agency costs under an LBO. First, the management may be willing to take up investment proposals which call for disproportionate effort on their part, as LBO facilitates compensation arrangement--allowing them to gain disproportionately. Second, LBO may lead to improved efficiency in their existing operations (DDR (1984), Travlos & Millon (1985)). Gunay (1985) criticizes this view by saying that managerial efficiency could not be improved so much in LBO offers such that the firms' values increase overnight.

DDR (1984) in their paper on LBOs come up with some support from the data for this hypothesized effect. They argue that agency costs of debt financing are reduced because third party equity investors have long term relationships with institutional lenders. Consequently, new equity owners have reduced incentives to transfer wealth from leaders, which encourages additional borrowing and thus provides the indirect benefit of a greater tax shield. Their data provides some support for the hypothesis (though data was available for only 5 LBO firms). For these, they observed the median debt to assets ratio to increase rapidly from pre to post offer dates.

A potentially better test of the above hypothesis on announcement period returns would require data on fractional ownership by insider stockholders before LBO. Smaller the fractional ownership by the management before the LBO greater the potential for reduction in agency cost after an LBO. Thus a significantly negative relationship between pre LBO proportional ownership by the management and the event period residuals will be an evidence in favor of the Agency Cost Hypothesis. A negative or insignificant relationship will not be consistent with the Agency Cost Hypothesis. We do not carry out this analysis due to the lack of resources to collect the needed data.

3.3 Tax Shield Hypothesis

Another possible source of gain from the LBO may be related to the increase in debt held by the firm which goes private. As mentioned by Masulis (1980) the large increase in debt increases the firm's tax shield which should, in turn, increase the value of the firm by an amount equal to the capitalized tax shield multiplied by the corporate tax rate. In the case of exchange offers, this has been analyzed extensively by Masulis (1980, 1983) who concludes that abnormal returns experienced with exchange offers are at least partly due to the change in tax shields.

Travlos and Millon (1985) have examined the hypothesis in the case of LBOs by testing the relationship between change in capital structure and announcement period abnormal returns, a similar procedure to that of Masulis'. A positive relationship between abnormal returns and increase in debt could lead to a conclusion that part of abnormal returns is due to tax shields from new debt. The data in the sample studied by Travlos and Millon (1985) failed to establish a positive relationship and they

conclude that announcement period abnormal returns are not related to the firm's expected increase in debt. The unavailability of resources to gather complete data on capital structure changes during an LBO kept us from performing the test of this hypothesis.

3.4 Senior Security Holders Wealth Expropriation Hypothesis

If protective covenants of one or more classes of senior security holders failed to strictly preclude increase in the amount of senior security of equal or senior standing, these senior security holders can suffer losses if there is an unanticipated new issue of senior security of equal or senior standing. At the same time, the common stockholders gain since the market requires lower rate of return on newly issued senior securities than it would have if newly issued senior securities were subordinated to existing senior securities (Masulis (1978)).

Masulis (1980) finds that when an exchange offer is announced which increases leverage, announcement period return for non-convertible senior securities with incomplete protective covenants is significantly negative. This supports the senior security holders wealth expropriation hypothesis. In this study we investigate LBO announcement period returns for senior securities using a procedure similar to the one used by Masulis. We are not aware of any study which has attempted to analyze senior security returns related to LBOs.

3.5 Gains Sharing Hypothesis

The real resource gains experienced when affecting a LBO due to the reasons mentioned in four hypotheses above may not by itself imply that public stockholders benefit but there are possible reasons to believe

that they (public stockholders) do share in these gains. For instance in a perfectly competitive battle for corporate control, any gains from an LBO would be shared by stockholders. While the perfect competition condition is not satisfied where management already owns a major share in the corporation (as is generally the case when a LBO is initiated), the inside management's strong position will deter outside teams from bearing the costs to take the firm private. Also, if the inside management has a strict advantage over outside management, the perfect competition conditions are not met. Nevertheless, minority stockholders can be expected to share in the gains from going private. The reason that minority stockholders should gain is that they have rights that make their cooperation necessary to take the firm private through LBO. These rights are (1) the right to block a transaction through minority stockholder veto and (2) the right to challenge a transaction through private litigation.[1]

The gains sharing hypothesis could be supported if we observe significant positive abnormal common stock returns due to LBO announcement.[2] The gains sharing hypothesis would be refuted if we observed no change or a decrease in public stockholder wealth (or abnormal returns) when the proposal for an LBO is announced.

DDR (1984) tested this hypothesis and observed significant average wealth increases for common stockholders due to LBO announcements. Their evidence is consistent with the gains-sharing argument.

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[1]For more details see DDR (1984) pp. 374-375.

[2]Tests of the first three hypotheses and to some extent the fourth hypothesis is predicated on this being true.

4. METHODOLOGY

4.1 Data Description

The initial search yielded 53 firms involved in leveraged buyout transactions between the period of June 1982 and June 1985. Forty-five of these firms were selected from a listing of the 100 largest acquisitions or LBOs (in dollars) as listed in Mergers and Acquisitions for the period June 1982 and June 1985. Eight additional companies were identified through a search of The Wall Street Journal Index, for the same period, and from Moody's Industrials firm indexes. The public announcement dates of the proposed buyouts were identified and were taken to be the date when the offer was first published in The Wall Street Journal.[3]

The market value of each transaction was obtained from Mergers and Acquisition and The Wall Street Journal article announcing the transaction. The values for total assets, long term debt, and current liabilities before and after the buyout (wherever available) were obtained from the Moody's Monthly Bond Guides and Stock Guides.

4.2 Sample Construction

The following sample selection criteria were imposed on each company for inclusion in the sample for common stock analysis in order to have a good and reliable data for analysis.

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[3]The average time passing between the initial announcement date (when the buyout was first announced) and the effective date (when the buyout was actually completed) was 3.22 months in our sample, with 6.3 months as the longest period and 1.8 months as the shortest.

1. They had a determinate announcement date. Four companies did not satisfy this criterion and were thus excluded from the sample.
2. They were listed on the New York Stock Exchange or the American Stock Exchange at the time of the announcement of the proposal. Ten companies did not satisfy this criterion and were thus excluded from the sample.
3. They had experienced no other major event involving capital structure changes during and around (ten days prior and after) the announcement. Three companies did not satisfy this criterion and were thus excluded from the sample.
4. The buyout was successfully completed. Four companies did not satisfy this criterion and were thus excluded from the sample.
5. The buyout was successfully completed for the company as a whole and not certain parts or units of it. Three companies did not satisfy this criterion and were thus excluded from the sample.
6. The daily returns data on the firm's common stock was available on the CRSP daily returns tape, for the period surrounding (300 days before to 10 days after) the announcement date.

After the screening, 29 offers were found to satisfy all six criteria. Their major characteristics are summarized in Appendix A. The list of companies with their names, announcement dates, and delisting dates appears in Appendix B.

The inclusion of companies in senior security analysis face the following selection criteria:

1. The company had that particular kind of senior security trading in the 22 days surrounding the announcement date (11 days before and 10 days after) of the LBO for at least two days.
2. The senior securities are traded on the New York Stock Exchange or the American Stock Exchange.
3. The buyout was successfully completed for the company as a whole and not certain parts or units of it.

After the screening, straight bonds of 11 companies, convertible bonds of 2 companies, straight preferred stocks of 3 companies, and convertible preferred stocks of 2 companies were found to satisfy the above criteria. Analysis of Convertible Bond, Straight Preferred, and Convertible Preferred Stock was not carried out because of the lack of sufficient number of companies satisfying the criteria.

4.3 Analysis of Common Stocks

4.3.1 Measuring Abnormal Return. In order to assess the impact of new information on an event on security prices we use the daily Market Model Residuals.[3]

$$\hat{e}_{jt} = R_{jt} - \hat{a}_j - \hat{b}_j R_{mt}$$

where

$\hat{e}_{jt}$ = abnormal return of security j on day t.

R_{jt} = actual return on stock j on day t.

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[3]While some doubts were raised by Brown and Warner (1980), Masulis (1980) and Dann (1981) about this procedure, Brown & Warner (1985) show that a simple methodology based on the market model is both well-specified and relatively powerful under a wide variety of conditions and in special cases even simpler methods also perform well.

$\hat{a}_j$ and $\hat{b}_j$ = the market model parameter estimates for stock j using a 250 day estimation period starting from event day -300 to -51. The coefficients estimated above are used to compute the abnormal daily returns during the time interval -50 to +10. This period is excluded in estimating the coefficients to avoid any bias due to announcement of an event.[4]

R_{mt} = equally weighted return on the market, obtained from the CRSP tapes.

t = the event day measured relative to the first announcement date.

The average abnormal return or prediction error ($\hat{e}$) of all the firms in the sample is given by

$$\bar{A}_t = \frac{1}{N} \sum_{j=1}^{N} \hat{e}_{jt}$$

where N is the number of firms for which the daily returns exist on day t (29 in our study).

The average cumulative abnormal returns CA is defined as

$$\overline{CA}_{t_1 t_2} = \sum_{t=t_1}^{t_2} \bar{A}_t$$

where

$\overline{CA}_{t_1 t_2}$ = the cumulated average residual from event day t_1 through day t_2.

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[4]For any stock which had missing returns during this period, return for a missing day was calculated as the geometric mean rate of return. Most of the missing returns were on day -1 or 0, possibly because of suspension of trading due to the announcement of the LBO.

4.3.2 Calculation of the Test Statistic[5]. The null hypothesis to be tested is that the mean day -1 and 0 excess return is equal to 0. The test statistic for any event day t is

$$T = \frac{\bar{A}_t}{\hat{S}\ (\bar{A}_t)}$$

The standard deviation $\hat{S}\ (\bar{A}_t)$ is measured as follows[6]

$$\hat{S}\ (\bar{A}_t) = \sqrt{\sum_{t=-110}^{t=+51} (\bar{A}_t - \bar{\bar{A}}) \Big/ 59}$$

where

$$\bar{\bar{A}} = \frac{1}{60} \sum_{t=-110}^{t=-51} \bar{A}_t$$

The significance of the cumulative average residuals over days t_1, t_2, is tested as follows:

$$T = \frac{\overline{CA}\ t_1 t_2}{\hat{S}\ (\overline{CA}\ t_1 t_2)}$$

where

$$\overline{CA}\ t_1 t_2 = \sum_{t=t_1}^{t_2} \bar{A}_t$$

$\hat{S}\ (\overline{CA}\ t_1 t_2)$ = Standard deviation of $\overline{CA}\ t_1 t_2$ after adjusting for first three autocorrelations of $\bar{A}_t$.[7]

We also calculate the proportion of securities with positive residuals for common stocks. The sign test is performed on these proportions. It tells us if the proportion securities with positive

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[5]The approach used is similar to that used by Brown and Warner (1985).

[6]Assuming that average prediction errors are normal, stationary, and independent over time.

[7]For details see Gupta (1985).

abnormal performance are different from .5. The test statistic is as follows.

$$Z_t = \frac{2\ (M_t + .5 - .5 \times N)}{\sqrt{N}}$$

where

Z_t is normally distributed

N is the number of securities in the sample

M_t is the number of securities with positive abnormal performance for event day t.

4.4. Straight Debt Analysis

Due to the lack of availability of electronically readable data for bonds, the procedure used for analyzing bonds is quite different from that used for common stocks. The procedure we use is identical to the procedure 3 in Appendix B of Dann (1980). We analyze daily bond returns from 11 days before announcement through 10 days after announcement of a buyout offer.

For each event day rate of return is calculated for securities trading on that day, by dividing the price for that day by the price for previous trading day if any and then subtracting 1 from the ratio.[8] If a security had no previous bond trading within the study period (-11 to +10 event days) its return is equal to zero for that day. Similarly if a security did not trade on a given day its return is also equal to zero.

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[8]No attempt was made to take accrued interest into account as on any given day its affect will be quite small. For example: for a security paying 15% annual coupon, accrued interest will account for only 0.04% return per day. Moreover since we are using comparison period approach it will cancel out anyway.

Under this procedure rate of return for a security following a non trading day is a multiple day rate of return.[9] We then calculate equally weighted average return for each event (company) having more than one security included in the sample. These average returns for each event are then averaged across events for each event day (-11 to +10). This procedure allows us to equally weight each event rather than each security.

Unlike common stocks, many of the debt issues trade infrequently. This poses potential difficulties for the measurement of the impact of the tender offer announcement and interpretation of the time series of average returns. If there is a lag between the announcement date and the date of the next trade, then for securities not trading on the announcement day, the impact of the tender offer will be observed in the next reported price. We, therefore, also calculate the initial post announcement (IPA) percentage rate of return for each security.

Under this procedure, IPA rate of return is calculated by dividing the first available trading price of bond on or after the announcement day by the first available price for that security before the event day and then subtracting 1 from the ratio. We then first calculate the equally weighted average of IPA for each event and then average them across events.

4.4.1 Calculation of the Test Statistic. To test the significance of announcement day residuals we use comparison period approach similar to Masulis (1980). Using that approach we calculate the announcement day T-statistics for bonds as follows:

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[9]On an average, instances in which no trade is reported on a day occurs 38% of the time for this sample of securities.

$$T = \left(\bar{R}_{pa} - \bar{R}_{pc}\right) \Bigg/ \sqrt{\left(\frac{(N_a-1)\cdot S_a^2 + (N_c-1)\cdot S_c^2}{N_a + N_c - 2}\right)\left(\frac{1}{N_a} + \frac{1}{N_c}\right)}$$

where $\bar{R}_{pa}$ and $\bar{R}_{pc}$ are the respective announcement period and comparison period mean daily residuals, S_a^2 and S_c^2 are the respective sample variances of the announcement period and comparison period daily residuals, and N_a and N_c are the respective number of daily portfolio returns in the announcement period and comparison period samples.

The sample variances are calculated from the time series of average daily returns for debt for the comparison and the announcement periods.

Defining day -11 to -2 as the comparison period and day -1 and 0 as the announcement period, the t-test for significance is performed. The null hypotheses to be tested is that the mean announcement period return is not significantly different from the mean comparison period portfolio return. Same equation is used for testing IPA also, but since we have only one day average return we have $N_a = 1$ and $S_a = 0$.

4.5 Test of Transaction Cost Hypothesis

The procedure used to test the transaction cost hypothesis involves running a regression between announcement day(s) abnormal returns for common stocks and the market value of the buyout. A significant negative correlation would suggest that reduction of transaction costs associated with public ownership of a company is a source of abnormal returns.

5. EMPIRICAL RESULTS

5.1 Behavior of the Residuals for Common Stock

In Table 1, column 1 identifies the trading day relative to day 0 (the announcement day), column 2 presents the Abnormal Percentage Returns on that day, column 3 presents the t-statistic of the return on each day, column 4 the proportion of returns greater than zero on that day, column 5 the z-statistic of the proportions, column 6 the average percentage stock returns and column 7 the average percentage market return on a particular event day.

The day -1 abnormal return for the sample is 4.652% and the day 0 return is 3.295%.[10] The announcement period sum of abnormal returns is 7.947% (Table 2). The associated t-statistic is 13.97 which indicates a significantly positive average return at any conventional level of statistical significance. Looking at the Z statistic test of the proportions we see they are significant with the proportions of residuals greater than zero being 79.3% and 82.8% for day -1 and day 0 respectively and 86.2% for two days combined. Table 3 shows the cumulative average residuals from day -50 to +10 and the accompanying statistics similar to Table 1. Observing Table 3 along with Figure 2 (plot of CAR over days -50 to +10), we see a possible leakage of information about the LBO 48 days before the announcement.[11] From day -48 to day +1, one could have

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[10] This timing pattern is not unexpected as we are taking date of publication of announcement in The Wall Street Journal as the announcement date. If the LBO is announced before the close of trading in the exchanges, the previous day affect should be observed on day -1 otherwise it should be observed in day 0.

[11] We would infer possible leakages in the market about the acquisition offer--either through the financing companies or banks or the management/group.

earned a cumulative average residual of 27.64%. These results are consistent with the gains sharing hypothesis that stockholders benefit from the announcement of the LBO.

DDR (1984) found the event period abnormal returns to be 16.99% with a t-statistic of 20.66, in a sample of 23 leveraged buyouts over the period 1973-1980. Travlos & Millon (1985) in their study of LBOs found day -1 and 0 return of 7.69% and 7.36% respectively in a sample of 61 Leveraged Buyouts in the period 1975-1983. It was significant with t statistics of 23.73 and 27.34 for day -1 and day 0 respectively. Gunay (1985) in his sample of 110 firms over the period 1979-1984 observes day -1 and 0 returns of 10.12% and 7.12% both being significant with t=36.45 and 9.43 respectively.

The difference in the event period abnormal returns between our study and those mentioned above can be attributed to a different sample over a different time period. Another possible reason could be that the market has become better at anticipating LBOs, due to leakages in information. This is supported by the fact that the CARs in our study are similar to those observed by the other studies mentioned above.

DDR (1984) report a 27.03% CAR over the period day -40 to 0, this is quite similar to 25.55% CAR for our study over the same period. CAR of 18.12% is observed over days -15 to 0 by Travlos & Millon (1985), in comparison we report 13.84% CAR for the same period. Gunay (1985) observes 25.66% CAR over the event period -50 to 0 which is very similar to CAR of 27.25% for our study over the same period.

The post announcement CARs are shown in Table 4 and they are not statistically significant. This result along with the plot of CAR in

Figure 2 suggests that the market is efficient with respect to LBO announcement as the CARs are fairly constant after the buyout is announced and on the average an individual will not be able to make profit from an LBO announcement.

Figure 3 shows the plots of raw Cumulative Average Stock Returns (CASR) for stocks in our sample and the Cumulative Average Market Return (CAMR) on days -50 to +10. This plot further strengthens our argument and indicates that abnormal returns are not likely to be sensitive to model specification.

As a test for the transaction cost hypothesis we run a regression between the sum of average residuals (SAR) over day -1 and day 0 and the total market value of the company (Table 5). The beta for this regression is -0.014 which indicates for each ten million increase in the value of a company SAR declines by 0.014%. However the beta is not statistically significant. The correlation coefficient, though negative (-0.081), is not significant either. Thus, the evidence at best is very weak in favor of transactions cost-hypothesis. This evidence is very similar to that obtained by Travlos and Millon (1985).

5.2 Behavior of Raw Returns for Straight Bonds

Table 6 presents the raw returns on straight bonds over a 22 day period for 11 companies involving 26 different securities. The analysis of returns focuses on the immediate vicinity of the buyout. Since only 11 of the original 63 buyout offer announcements are represented in the sample of debt analysis, the analysis is based on a much smaller sample than that of common stock returns.

We see large negative returns for days -1 and 0. These returns add up to approximately -0.80%. We carry out a t-test on average returns for day -1 and 0 using average returns for days -11 to -2 as the comparison period. The t-test yields t=-3.27 which is significantly negative. Complete details for this can be seen in Table 6. The Initial Post Announcement (IPA) Returns for these 11 securities is -1.692% with t=-10.26. Table 7 shows the CAR for these 11 securities. The CAR over the period day -1 to 4 is equal to -2.39% (σ=0.1789, comparison t-statistic=-5.07). Due to non trading of bonds and also because of the way we have calculated bond returns, where a security not trading on a given day is given a zero return for that day, this cumulative residual along with the IPA returns probably reflects the effect of an LBO on bondholders better than the announcement day average residuals. Both IPA and CAR over day -1 to 4 are larger in magnitude than we have seen in any other study. (Both are statistically significant also).

Figure 4 plots the CAR from day -11 to day 10 for straight bonds. The steep decline from day -1 to day +1 gives us an indication of the loss to bondholders. This loss is not due to the fall in the market as is clear from Figure 5 showing the CAR and CAMR (cumulative market return).

The evidence of negative returns therefore indicates that when an LBO is announced, the bondholders of the target company suffer significant losses. This evidence along with the evidence provided in the previous section seems to indicate that part of the benefits to common stockholders of the target company come at the expense of bondholders of the target company when an LBO is announced. To further confirm or refute the evidence we calculate a cross-sectional regression

between sum of raw returns over period -1,0 for bonds and common stocks for the 7 matched securities (Table 10).[12] The beta is found to be equal to -0.170 which indicates that for every 1% positive return for stockholders, bondholders lose 0.17%. The beta however is not significant. We find the correlation coefficient to be -0.513. Although it is not statistically significant at 5% level (possibly because of the small sample size), it is the strongest evidence we have seen in favor of the wealth transfer hypothesis.[13]

Masulis (1980) in his study of exchange offers finds event period (day -1,0) average return of -0.84% with a t-statistic of -2.7 for non-convertible bonds with incomplete protective covenants. Our results are similar, although we are not sure if he used a procedure similar to our procedure for calculating average bond returns. The procedure that we used probably underestimates the event period (days -1 and 0) returns in magnitude as we subsitute zero for any missing returns and include them in averaging. IPA and CAR which were quite large as reported above (-1.69% and -2.39% respectively) probably reflect the affect of LBO on bondholders more correctly. These results along with large negative cross correlation (-0.51) even though it is insignificant due to small sample size is the strongest evidence we have seen in favor of the wealth transfer hypothesis.

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[12]Tables 8 and 9 show the AR's and CAR's for the 7 matched securities which had both bond returns available for the announcement period. The evidence is similar to that for 11 securities.

[13]The cross correlation between IPA for bonds and day -1,0 CAR for stocks was surprisingly positive (0.089) but statistically insignificant (Table 11).

6. CONCLUSION

The purpose of this study was to investigate the effects on security holders when a proposal to buy a firm is announced through a leveraged buyout. Evidence indicates that the stockholders experience gains while bondholders experience a loss due to the announcement. The overall positive abnormal returns for common stocks support the gains sharing hypothesis. Possible source of gains from LBOs may be from a combination of reduction of transaction and agency costs, saving in taxes due to increased tax shield, and expropriation of bondholders wealth. We did not attempt to test the agency costs and tax shield hypothesis. Transaction cost hypothesis is not confirmed by the evidence. The evidence is quite strong in favor of bondholders wealth expropriation hypothesis, however, it does not explain all of the positive abnormal returns accruing to the stockholders.

The evidence seems to indicate that while minority shareholders may not need to be protected against LBOs they receive at least part of the gains associated with LBOs. At the same time bondholders should carefully examine the indenture agreement before buying bonds so that they may not suffer unexpected losses if management decides to go private by leveraging the firm. It may be worth mentioning here that average beta for the firms involved in LBOs was 0.902 which seems to indicate that firms involved in LBOs are the ones which have less than average market risk. Thus bondholders who may have thought that they are investing in low risk firms are probably surprised when that firm decides to go private using the LBO technique.

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TABLE 1

AVERAGE RESIDUALS FOR COMMON STOCKS AROUND LBO ANNOUNCEMENT
USING THE MARKET MODEL-I

DAY	AV RESID(%)	T-STAT	PROP>0	Z-STAT	AV STK RET IN %	AV MKT RET IN %
-50	0.582	1.35	0.586	0.93	0.615	0.009
-49	-0.795	-1.85	0.241	-2.79*	-0.942	-0.168
-48	0.316	0.73	0.552	0.56	0.322	0.032
-47	-0.089	-0.21	0.517	0.19	-0.016	0.121
-46	0.243	0.56	0.345	-1.67	0.463	0.143
-45	0.019	0.04	0.586	0.93	0.283	0.156
-44	0.172	0.40	0.414	-0.93	0.176	-0.047
-43	0.843	1.96*	0.448	-0.56	1.030	0.209
-42	0.646	1.50	0.483	-0.19	0.618	0.014
-41	-0.234	-0.54	0.448	-0.56	-0.317	-0.046
-40	1.009	2.35*	0.517	0.19	0.976	-0.006
-39	0.176	0.41	0.414	-0.93	-0.087	-0.252
-38	1.090	2.53*	0.621	1.30	0.977	-0.051
-37	2.640	6.14*	0.586	0.93	2.520	-0.055
-36	0.749	1.74*	0.621	1.30	0.566	-0.107
-35	0.184	0.43	0.483	-0.19	0.247	0.030
-34	0.314	0.73	0.483	-0.19	0.213	-0.086
-33	0.514	1.19	0.655	1.67*	0.462	-0.028
-32	1.748	4.07*	0.552	0.56	1.891	0.163
-31	0.971	2.26*	0.655	1.67*	0.947	0.011
-30	0.096	0.22	0.483	-0.19	0.101	-0.002
-29	-0.313	-0.73	0.483	-0.19	-0.319	-0.036
-28	-0.192	-0.45	0.552	0.56	-0.091	0.029
-27	-0.273	-0.63	0.379	-1.30	-0.045	0.201
-26	0.601	1.40	0.448	-0.56	0.698	-0.038
-25	0.243	0.56	0.552	0.56	0.339	0.153
-24	-0.084	-0.20	0.310	-2.04*	0.227	0.254
-23	0.356	0.83	0.552	0.56	0.316	0.013
-22	0.378	0.88	0.552	0.56	0.275	-0.084
-21	0.186	0.43	0.517	0.19	0.284	0.087
-20	0.163	0.38	0.448	-0.56	0.164	0.000
-19	0.147	0.34	0.448	-0.56	0.202	0.015
-18	0.103	0.24	0.483	-0.19	0.213	0.169
-17	0.624	1.45	0.586	0.93	0.700	-0.010
-16	0.283	0.66	0.448	-0.56	0.170	-0.048
-15	0.249	0.58	0.552	0.56	0.408	0.154
-14	-0.014	-0.03	0.517	0.19	0.107	0.051
-13	0.390	0.91	0.483	-0.19	0.473	0.149
-12	0.651	1.51	0.552	0.56	0.575	-0.060
-11	0.301	0.70	0.586	0.93	0.252	-0.003
-10	0.317	0.74	0.483	-0.19	0.391	0.072
-9	0.079	0.18	0.552	0.56	0.180	-0.029
-8	0.616	1.43	0.724	2.41*	0.784	0.164
-7	0.089	0.21	0.517	0.19	0.251	0.051
-6	0.195	0.45	0.448	-0.56	0.180	-0.021
-5	0.525	1.22	0.621	1.30	0.664	0.062
-4	1.076	2.50*	0.655	1.67*	1.237	0.039
-3	0.730	1.70*	0.724	2.41*	1.072	0.210
-2	0.684	1.59	0.552	0.56	1.135	0.322
-1	4.652	10.82*	0.793	3.16*	4.725	0.106
0	3.295	7.66*	0.828	3.53*	3.256	0.078
1	0.178	0.41	0.552	0.56	0.231	0.099
2	-0.365	-0.85	0.379	-1.30	-0.160	0.107
3	0.297	0.69	0.552	0.56	0.245	-0.070
4	0.297	0.69	0.517	0.19	0.221	0.021
5	-0.239	-0.56	0.310	-2.04**	-0.233	0.144
6	0.210	0.49	0.621	1.30	0.032	-0.154
7	0.131	0.30	0.448	-0.56	0.220	0.063
8	-0.119	-0.28	0.379	-1.30	-0.131	0.050
9	-0.022	-0.05	0.483	-0.19	0.092	0.076
10	0.150	0.35	0.517	0.19	0.242	-0.017

DF= 59 N= 29 STANDARD DEVIATION IN % (60, 0.0)= 0.430
AVERAGE ALPHA IN % = -0.004 AVERAGE BETA = 0.902

NOTES:
1. * INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING ONE TAIL TEST.
2. ** INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST.
3. # INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST BUT WITH THE WRONG SIGN.
4. DF REFERS TO DEGREES OF FREEDOM OF T-STAT.
5. N REFERS TO TOTAL NUMBER OF SECURITIES EXPERIENCING THE EVENT
6. THE FIRST TWO ITEMS IN PARENTHESES ARE RESPECTIVELY, NUMBERS OF PRE AND POST EVENT PERIODS OVER WHICH THE STD.IS CALCULATED. THE THIRD ITEM TELLS US WHETHER STD. DEV. IS ESTIMATED OVER THE PERIODS INCLUDED IN ESTIMATION OF PARAMETERI=0), OR OUTSIDE IT(=1).

TABLE 2

SUM OF AVERAGE RESIDUALS FOR COMMON STOCKS AROUND LBO ANNOUNCEMENT
USING THE MARKET MODEL-I

SUM OVER DAY TO DAY		SAR IN %	STD DEV IN %	T-STAT	DF	PROP>0	Z-STAT	SAR STK IN %	SAR MKT IN %
-1	0	7.947	0.569	13.97*	118	0.862	3.90*	7.981	0.183

NOTES:
1. * INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL. USING ONE TAIL TEST.
2. ** INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST.
3. # INDICATES THAT TEST STATTISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST BUT WITH THE WRONG SIGN.
4. DF REFERS TO DEGREES OF FREEDOM OF T-STAT.

TABLE 3

CUMULATIVE AVERAGE RESIDUALS FOR COMMON STOCKS AROUND LBO ANNOUNCEMENT
USING THE MARKET MODEL-I

DAY	CAR IN %	STD. DEV. IN %	T-STAT	DF	PROP>0	Z-STAT	CAR STK IN %	CAR MKT IN %
-50	0.582	0.430	1.35	59	0.586	0.93	0.615	0.009
-49	-0.213	0.569	-0.37	118	0.448	-0.56	-0.327	-0.159
-48	0.103	0.695	0.15	177	0.552	0.56	-0.005	-0.127
-47	0.014	0.787	0.02	236	0.448	-0.56	-0.022	-0.006
-46	0.257	0.870	0.29	295	0.448	-0.56	0.441	0.137
-45	0.276	0.945	0.29	354	0.517	0.19	0.724	0.293
-44	0.447	1.015	0.44	413	0.483	-0.19	0.900	0.246
-43	1.291	1.081	1.19	472	0.586	0.93	1.930	0.455
-42	1.937	1.142	1.70	531	0.621	1.30	2.548	0.469
-41	1.702	1.201	1.42	590	0.552	0.56	2.231	0.424
-40	2.712	1.256	2.16**	649	0.586	0.93	3.207	0.417
-39	2.888	1.310	2.20**	708	0.552	0.56	3.120	0.165
-38	3.978	1.361	2.92**	767	0.586	0.93	4.097	0.114
-37	6.618	1.410	4.69**	826	0.586	0.93	6.616	0.059
-36	7.366	1.458	5.05**	885	0.586	0.93	7.182	-0.048
-35	7.551	1.504	5.02**	944	0.655	1.67	7.429	-0.018
-34	7.864	1.549	5.08**	1003	0.621	1.30	7.642	-0.104
-33	8.378	1.593	5.26**	1062	0.621	1.30	8.104	-0.132
-32	10.126	1.635	6.19**	1121	0.621	1.30	9.995	0.031
-31	11.097	1.677	6.62**	1180	0.690	2.04**	10.942	0.043
-30	11.193	1.717	6.52**	1239	0.690	2.04**	11.042	0.041
-29	10.880	1.756	6.19**	1298	0.759	2.79**	10.726	0.005
-28	10.689	1.795	5.95**	1357	0.724	2.41**	10.632	0.034
-27	10.416	1.833	5.68**	1416	0.690	2.04**	10.588	0.235
-26	11.017	1.870	5.89**	1475	0.655	1.67	11.285	0.197
-25	11.260	1.906	5.91**	1534	0.724	2.41**	11.624	0.350
-24	11.175	1.942	5.76**	1593	0.655	1.67	11.851	0.604
-23	11.531	1.976	5.83**	1652	0.724	2.41**	12.167	0.618
-22	11.909	2.011	5.92**	1711	0.724	2.41**	12.442	0.534
-21	12.095	2.045	5.92**	1770	0.759	2.79**	12.726	0.620
-20	12.258	2.078	5.90**	1829	0.724	2.41**	12.890	0.621
-19	12.405	2.111	5.88**	1888	0.724	2.41**	13.092	0.635
-18	12.508	2.143	5.84**	1947	0.724	2.41**	13.305	0.804
-17	13.132	2.174	6.04**	2006	0.724	2.41**	14.005	0.795
-16	13.415	2.206	6.08**	2065	0.724	2.41**	14.174	0.746
-15	13.664	2.237	6.11**	2124	0.724	2.41**	14.582	0.900
-14	13.650	2.267	6.02**	2183	0.793	3.16**	14.689	0.951
-13	14.040	2.297	6.11**	2242	0.793	3.16**	15.162	1.101
-12	14.691	2.327	6.31**	2301	0.828	3.53**	15.738	1.040
-11	14.993	2.356	6.36**	2360	0.828	3.53**	15.990	1.037
-10	15.309	2.385	6.42**	2419	0.828	3.53**	16.380	1.109
-9	15.388	2.413	6.38**	2478	0.828	3.53**	16.560	1.081
-8	16.004	2.441	6.56**	2537	0.828	3.53**	17.344	1.245
-7	16.094	2.469	6.52**	2596	0.828	3.53**	17.596	1.296
-6	16.289	2.497	6.52**	2655	0.828	3.53**	17.775	1.276
-5	16.814	2.524	6.66**	2714	0.828	3.53**	18.440	1.338
-4	17.890	2.551	7.01**	2773	0.828	3.53**	19.676	1.377
-3	18.621	2.578	7.22**	2832	0.828	3.53**	20.749	1.588
-2	19.305	2.604	7.41**	2891	0.828	3.53**	21.883	1.910
-1	23.957	2.630	9.11**	2950	0.931	4.64**	26.608	2.016
0	27.352	2.656	10.26**	3009	0.931	4.64**	29.864	2.093
1	27.430	2.682	10.23**	3068	0.931	4.64**	30.095	2.192
2	27.065	2.707	10.00**	3127	0.897	4.27**	29.935	2.299
3	27.362	2.733	10.01**	3186	0.897	4.27**	30.180	2.229
4	27.660	2.757	10.03**	3245	0.897	4.27**	30.402	2.250
5	27.420	2.782	9.86**	3304	0.897	4.27**	30.168	2.394
6	27.631	2.807	9.84**	3363	0.897	4.27**	30.200	2.240
7	27.762	2.831	9.81**	3422	0.897	4.27**	30.421	2.303
8	27.643	2.855	9.68**	3481	0.897	4.27**	30.289	2.353
9	27.621	2.879	9.59**	3540	0.897	4.27**	30.381	2.429
10	27.772	2.903	9.57**	3599	0.897	4.27**	30.623	2.412

AUTO1=-0.126 AUTO2= 0.057 AUTO3=-0.061

NOTES:
1. * INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING ONE TAIL TEST.
2. ** INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST.
3. # INDICATES THAT TEST STATTISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST BUT WITH THE WRONG SIGN.
4. DF REFERS TO DEGREES OF FREEDOM OF T-STAT.
5. ACCUMLATION OF AVERAGE RESIDUALS BEGINS ON THE FIRST DATE IN THE TABLE.
6. AUTO1 TO AUTO3 REPRESENT AUTOCORRELATIONS OF AVERAGE RESIDUALS WITH LAG1 TO LAG3.

TABLE 4

POST ANNOUNCEMENT CUMULATIVE AVERAGE RESIDUALS FOR COMMON STOCKS AROUND LBO ANNOUNCEMENT USING THE MARKET MODEL-I

DAY	CAR IN %	STD. DEV. IN %	T-STAT	DF	PROP>0	Z-STAT	CAR STK IN %	CAR MKT IN %
1	0.178	0.430	0.41	59	0.552	0.56	0.231	0.099
2	-0.187	0.569	-0.33	118	0.414	-0.93	0.071	0.206
3	0.110	0.695	0.16	177	0.517	0.19	0.317	0.136
4	0.408	0.787	0.52	236	0.345	-1.67	0.538	0.157
5	0.169	0.870	0.19	295	0.414	-0.93	0.304	0.301
6	0.379	0.945	0.40	354	0.448	-0.56	0.337	0.147
7	0.510	1.015	0.50	413	0.448	-0.56	0.557	0.210
8	0.391	1.081	0.36	472	0.483	-0.19	0.426	0.260
9	0.369	1.142	0.32	531	0.448	-0.56	0.518	0.336
10	0.520	1.201	0.43	590	0.483	-0.19	0.759	0.319

NOTES:
1. * INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING ONE TAIL TEST.
2. ** INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST.
3. # INDICATES THAT TEST STATTISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST BUT WITH THE WRONG SIGN.
4. DF REFERS TO DEGREES OF FREEDOM OF T-STAT.
5. ACCUMLATION OF AVERAGE RESIDUALS BEGINS ON THE FIRST DATE IN THE TABLE.

TABLE 5

REGRESSION BETWEEN SUM OF AVERAGE RESIDUALS AROUND LBO ANNOUNCEMENT AND TOTAL MARKET VALUE OFTHE COMPANY USING THE MARKET MODEL-I

SUM OVER DAY TO DAY		ALPHA IN %	BETA	CORRELATION COEFFICIENT	SST IN %%	SSR IN %%	SSE IN %%	MSSR IN %%	MSSE IN %%	F-STAT	AVERAGE X IN TEN MILLION DOLLARS
-1	0	8.749	-0.014	-0.081	2414.731	15.658	2399.073	15.658	88.855	0.18	57.2620
	T-STAT	(3.38**)	(-0.42)	(-0.42)							
	DF	27	27	27	28	1	27			(1, 27)	

NOTES:
1. * INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL, USING ONE TAIL TEST.
2. ** INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST.
3. # INDICATES THAT TEST STATTISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST BUT WITH THE WRONG SIGN.
4. DF REFERS TO DEGREES OF T-STAT OR F-STAT.
5. X REFERS TO THE INDEPENDENT VARIABLES WHICH IS TOTAL MARKET VALUE OF THE COMPANY

TABLE 6

AVERAGE RESIDUALS FOR UNMATCHED STRAIGHT BONDS AROUND LBO ANNOUNCEMENT USING THE RAW RET MODEL

DAY	AV RESID(%)	PROP>0	Z-STAT	AV SEC RET IN %	AV MKT RET IN %
-11	0.000	0.000	-3.32*	0.000	-0.133
-10	-0.037	0.000	-3.32*	-0.037	0.207
-9	-0.108	0.000	-3.32*	-0.108	0.195
-8	0.325	0.273	-1.51	0.325	0.165
-7	-0.105	0.000	-3.32*	-0.105	0.149
-6	0.000	0.091	-2.71*	0.000	-0.118
-5	0.001	0.091	-2.71*	0.001	0.132
-4	-0.021	0.091	-2.71*	-0.021	0.177
-3	0.015	0.182	-2.11*	0.015	0.441
-2	0.346	0.364	-0.90	0.346	0.244
-1	-0.212	0.182	-2.11*	-0.212	0.166
0	-0.588	0.000	-3.32*	-0.588	0.023
1	-0.613	0.182	-2.11**	-0.613	0.424
2	-0.328	0.182	-2.11**	-0.328	0.288
3	-0.440	0.091	-2.71**	-0.440	0.042
4	-0.207	0.182	-2.11**	-0.207	-0.098
5	0.363	0.364	-0.90	0.363	0.206
6	-0.001	0.182	-2.11**	-0.001	0.121
7	0.249	0.273	-1.51	0.249	0.222
8	0.092	0.182	-2.11**	0.092	0.222
9	0.065	0.182	-2.11**	0.065	0.260
10	-0.308	0.091	-2.71**	-0.308	0.261

	AVERAGE	STANDARD DEVIATION	N	T-STAT
COMPARISON PERIOD	0.041	0.161	10	
EVENT PERIOD	-0.400	0.266	2	-3.27*
IPA	-1.692	0.0	1	-10.26*

OF EVENTS = 11 # OF SEC = 26

NOTES:
1. * INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING ONE TAIL TEST.
2. ** INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST.
3. # INDICATES THAT TEST STATTISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST BUT WITH THE WRONG SIGN.
4. DF REFERS TO DEGREES OF FREEDOM OF T-STAT.
5. N REFERS TO TOTAL NUMBER OF SECURITIES EXPERIENCING THE EVENT.

TABLE 7

CUMULATIVE AVERAGE RESIDUALS FOR UNMATCHED STRAIGHT BONDS AROUND ANNOUNCEMENT USING THE RAW RET MODEL

DAY	CAR IN %	PROP>O	Z-STAT	CAR SEC IN %	CAR MKT IN %
-11	0.000	0.000	-3.32**	0.000	-0.133
-10	-0.037	0.000	-3.32**	-0.037	0.074
-9	-0.146	0.000	-3.32**	-0.146	0.269
-8	0.180	0.182	-2.11**	0.180	0.434
-7	0.075	0.182	-2.11**	0.075	0.584
-6	0.074	0.182	-2.11**	0.074	0.466
-5	0.075	0.182	-2.11**	0.075	0.598
-4	0.054	0.182	-2.11**	0.054	0.775
-3	0.069	0.182	-2.11**	0.069	1.216
-2	0.414	0.273	-1.51	0.414	1.459
-1	0.202	0.182	-2.11**	0.202	1.625
0	-0.385	0.182	-2.11**	-0.385	1.649
1	-0.998	0.182	-2.11**	-0.998	2.073
2	-1.326	0.182	-2.11**	-1.326	2.360
3	-1.766	0.000	-3.32**	-1.766	2.402
4	-1.973	0.182	-2.11**	-1.973	2.304
5	-1.609	0.182	-2.11**	-1.609	2.510
6	-1.610	0.273	-1.51	-1.610	2.631
7	-1.361	0.273	-1.51	-1.361	2.853
8	-1.269	0.273	-1.51	-1.269	3.075
9	-1.205	0.364	-0.90	-1.205	3.335
10	-1.513	0.273	-1.51	-1.513	3.596

NOTES:

1. * INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING ONE TAIL TEST.
2. ** INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST.
3. # INDICATES THAT TEST STATTISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST BUT WITH THE WRONG SIGN.
4. DF REFERS TO DEGREES OF FREEDOM OF T-STAT.
5. ACCUMLATION OF AVERAGE RESIDUALS BEGINS ON THE FIRST DATE IN THE TABLE.

TABLE 8

AVERAGE RESIDUALS FOR MATCHED STRAIGHT BONDS AROUND LBO ANNOUNCEMENT USING THE RAW RET MODEL

DAY	AV RESID(%)	PROP>O	Z-STAT	AV SEC RET IN %	AV MKT RET IN %
-11	0.000	0.000	-2.65*	0.000	-0.060
-10	0.000	0.000	-2.65*	0.000	0.180
-9	0.000	0.000	-2.65*	0.000	0.323
-8	0.198	0.143	-1.89*	0.198	-0.009
-7	0.000	0.000	-2.65*	0.000	-0.265
-6	-0.059	0.000	-2.65*	-0.059	-0.013
-5	0.000	0.000	-2.65*	0.000	-0.031
-4	0.000	0.000	-2.65*	0.000	0.036
-3	-0.040	0.000	-2.65*	-0.040	0.120
-2	0.357	0.286	-1.13	0.357	0.146
-1	-0.462	0.000	-2.65*	-0.462	0.107
0	-0.032	0.000	-2.65*	-0.032	-0.461
1	-0.963	0.143	-1.89	-0.963	0.235
2	-0.225	0.143	-1.89	-0.225	-0.052
3	-0.651	0.000	-2.65**	-0.651	-0.311
4	-0.083	0.000	-2.65**	-0.083	-0.281
5	0.340	0.286	-1.13	0.340	-0.209
6	-0.082	0.143	-1.89	-0.082	-0.211
7	0.059	0.143	-1.89	0.059	0.093
8	0.022	0.143	-1.89	0.022	-0.093
9	0.039	0.143	-1.89	0.039	0.545
10	-0.489	0.000	-2.65**	-0.489	0.311

	AVERAGE	STANDARD DEVIATION	N	T-STAT
COMPARISON PERIOD	0.046	0.13	10	
EVENT PERIOD	-0.247	0.304	2	-2.42*
IPA	-1.596	0.0	1	-12.034*

NOTES:

1. * INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING ONE TAIL TEST.
2. ** INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST.
3. # INDICATES THAT TEST STATTISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST BUT WITH THE WRONG SIGN.
4. DF REFERS TO DEGREES OF FREEDOM OF T-STAT.
5. N REFERS TO TOTAL NUMBER OF SECURITIES EXPERIENCING THE EVENT.

TABLE 9

CUMULATIVE AVERAGE RESIDUALS FOR MATCHED STRAIGHT BONDS AROUND LBO ANNOUNCEMENT USING THE RAW RET MODEL

DAY	CAR IN %	PROP>O	Z-STAT	CAR SEC IN %	CAR MKT IN %
-11	0.000	0.000	-2.65**	0.000	-0.060
-10	0.000	0.000	-2.65**	0.000	0.120
-9	0.000	0.000	-2.65**	0.000	0.443
-8	0.198	0.143	-1.89	0.198	0.434
-7	0.198	0.143	-1.89	0.198	0.169
-6	0.139	0.143	-1.89	0.139	0.156
-5	0.139	0.143	-1.89	0.139	0.124
-4	0.139	0.143	-1.89	0.139	0.160
-3	0.098	0.143	-1.89	0.098	0.280
-2	0.455	0.286	-1.13	0.455	0.426
-1	-0.007	0.143	-1.89	-0.007	0.533
0	-0.039	0.143	-1.89	-0.039	0.072
1	-1.002	0.143	-1.89	-1.002	0.307
2	-1.227	0.143	-1.89	-1.227	0.255
3	-1.878	0.000	-2.65**	-1.878	-0.056
4	-1.961	0.000	-2.65**	-1.961	-0.337
5	-1.621	0.000	-2.65**	-1.621	-0.546
6	-1.703	0.143	-1.89	-1.703	-0.757
7	-1.644	0.143	-1.89	-1.644	-0.664
8	-1.622	0.143	-1.89	-1.622	-0.757
9	-1.584	0.286	-1.13	-1.584	-0.212
10	-2.073	0.143	-1.89	-2.073	0.098

NOTES:

1. * INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING ONE TAIL TEST.
2. ** INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAIL TEST.
3. ≠ INDICATES THAT TEST STATTISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAIL TEST BUT WITH THE WRONG SIGN.
4. OF REFERS TO DEGREES OF FREEDOM OF T-STAT.
5. ACCUMLATION OF AVERAGE RESIDUALS BEGINS ON THE FIRST DATE IN THE TABLE.

TABLE 10

REGRESSION BETWEEN SUM OF AVERAGE RESIDUALS FOR MATCHED STRAIGHT BONDS AND
SUM OF AVERAGE RESIDUALS FOR COMMON STOCKS
USING THE RAW RET MODEL

SUM OVER DAY TO DAY		ALPHA IN %	BETA	CORRELATION COEFFICIENT	SST IN %%	SSR IN %%	SSE IN %%	MSSR IN %%	MSSE IN %%	F-STAT	AVERAGE X IN %
-1	0	0.355	-0.170	-0.513	6.058	1.592	4.466	1.592	0.893	1.78	4.9853
	T-STAT	(0.49)	(-1.34)	(-1.34)							
	DF	5	5	5	6	1	5			(1, 5)	

NOTES:
1. * INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL, USING ONE TAIL TEST.
2. ** INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST.
3. # INDICATES THAT TEST STATTISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST BUT WITH THE WRONG SIGN.
4. DF REFERS TO DEGREES OF T-STAT OR F-STAT.
5. X REFERS TO THE INDEPENDENT VARIABLES WHICH IS SUM OF AVERAGE RESIDUALS FOR COMMON STOCKS OVER DAYS-1 TO 0.

TABLE 11

REGRESSION BETWEEN SUM OF IPA FOR MATCHED STRAIGHT BONDS AND
SUM OF AVERAGE RESIDUALS FOR COMMON STOCKS
USING THE RAW RET MODEL

SUM OVER DAY TO DAY		ALPHA IN %	BETA	CORRELATION COEFFICIENT	SST IN %%	SSR IN %%	SSE IN %%	MSSR IN %%	MSSE IN %%	F-STAT	AVERAGE X IN %
-1	0	-1.709	0.023	0.089	3.546	0.028	3.518	0.028	0.704	0.04	4.9853
	T-STAT	(-2.64**)	(0.20)	(0.20)							
	DF	5	5	5	6	1	5			(1, 5)	

NOTES:
1. * INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL, USING ONE TAIL TEST.
2. ** INDICATES THAT TEST STATISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST.
3. # INDICATES THAT TEST STATTISTIC IS SIGNIFICANT AT 5% LEVEL USING TWO TAILS TEST BUT WITH THE WRONG SIGN.
4. DF REFERS TO DEGREES OF T-STAT OR F-STAT.
5. X REFERS TO THE INDEPENDENT VARIABLES WHICH IS SUM OF AVERAGE RESIDUALS FOR COMMON STOCKS OVER DAYS-1 TO 0.

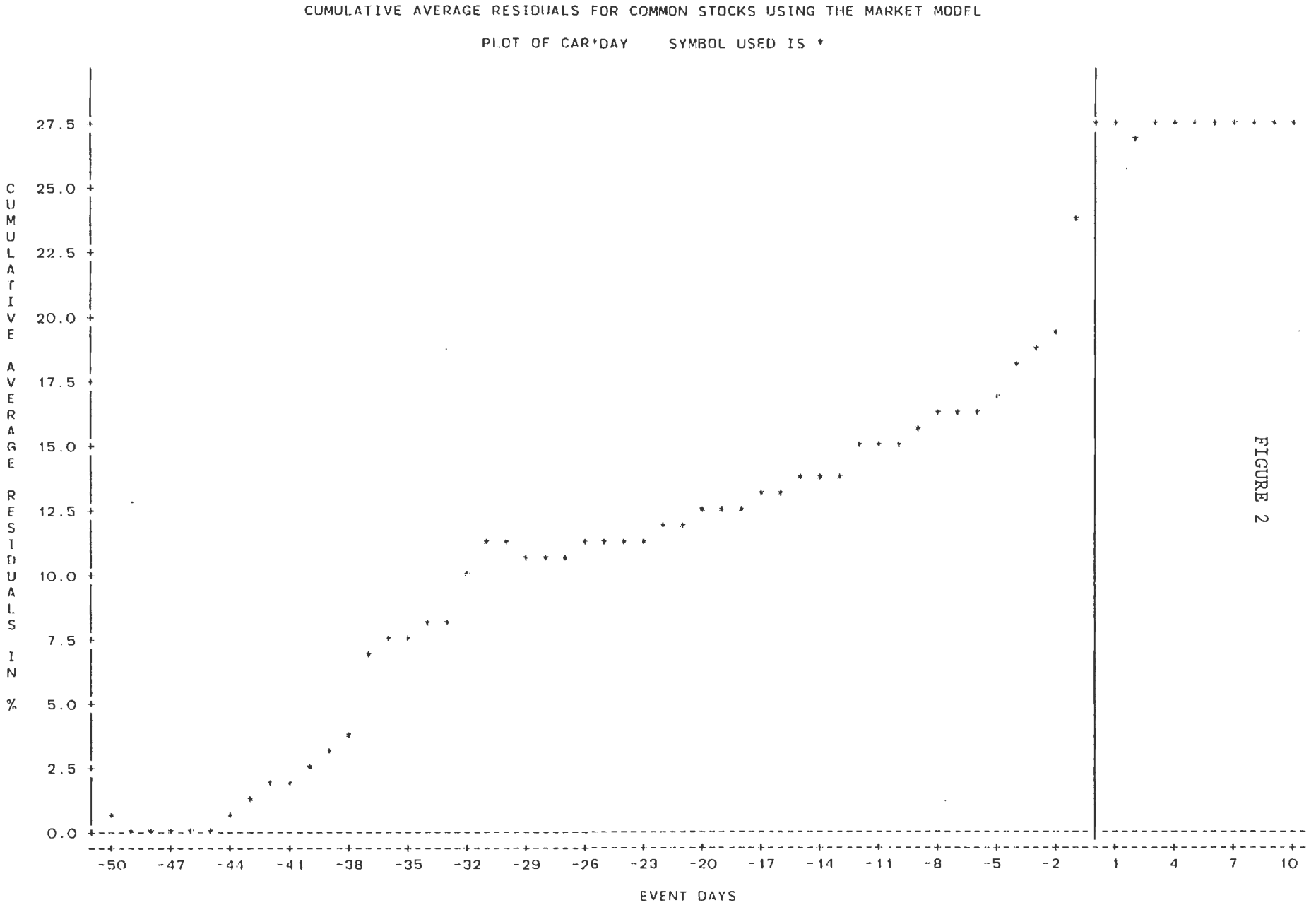
CUMULATIVE AVERAGE RESIDUALS FOR COMMON STOCKS USING THE MARKET MODEL
PLOT OF CAR*DAY SYMBOL USED IS *
CUMULATIVE AVERAGE RESIDUALS IN %
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
-50 -47 -44 -41 -38 -35 -32 -29 -26 -23 -20 -17 -14 -11 -8 -5 -2 1 4 7 10
EVENT DAYS

FIGURE 2

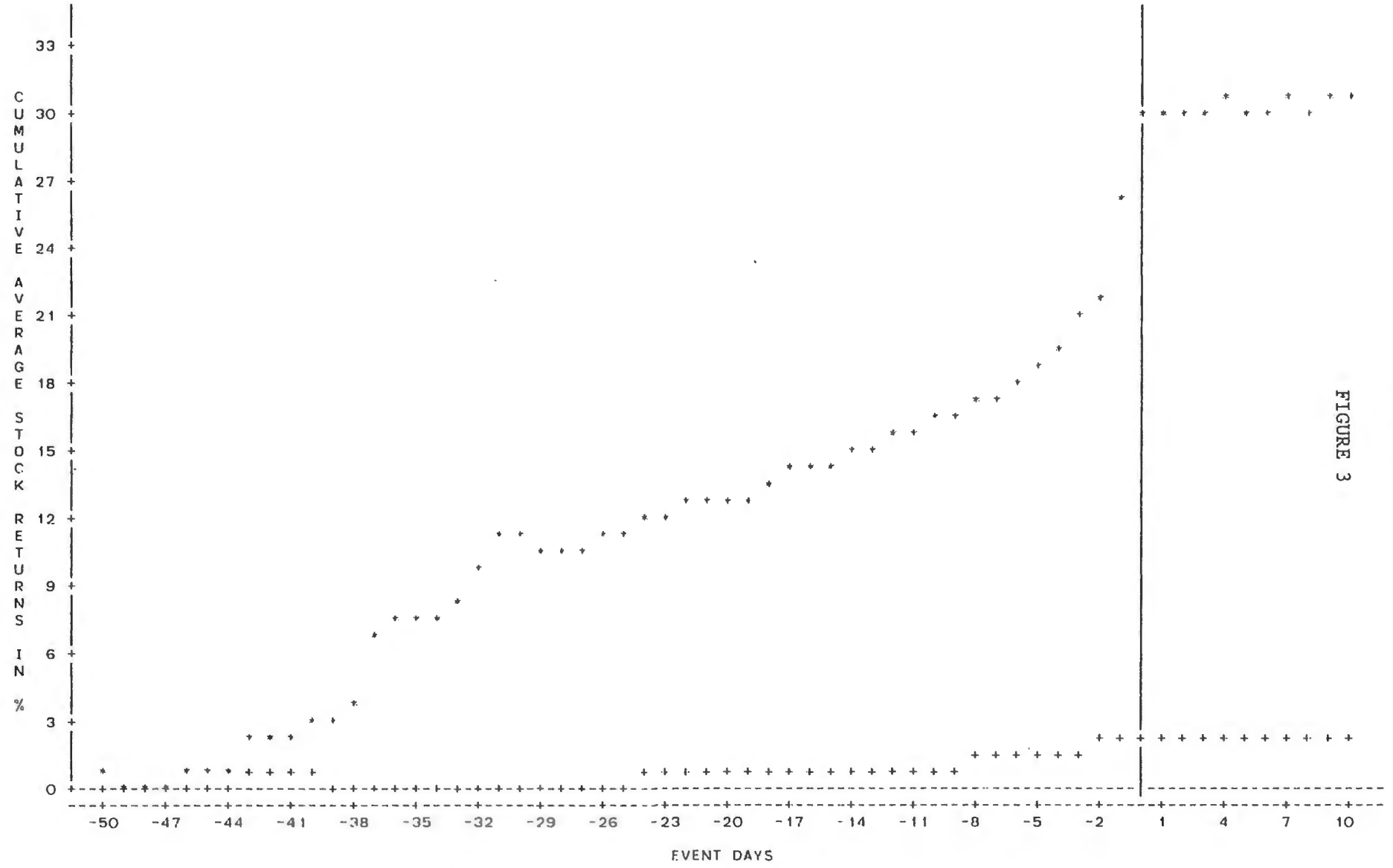
CUMULATIVE AVERAGE RETURNS FOR COMMON STOCKS.
PLOT OF CASR*DAY SYMBOL USED IS *
PLOT OF CAMR*DAY SYMBOL USED IS +
CUMULATIVE AVERAGE STOCK RETURNS IN %
33
30
27
24
21
18
15
12
9
6
3
0
-50 -47 -44 -41 -38 -35 -32 -29 -26 -23 -20 -17 -14 -11 -8 -5 -2 1 4 7 10
EVENT DAYS

FIGURE 3

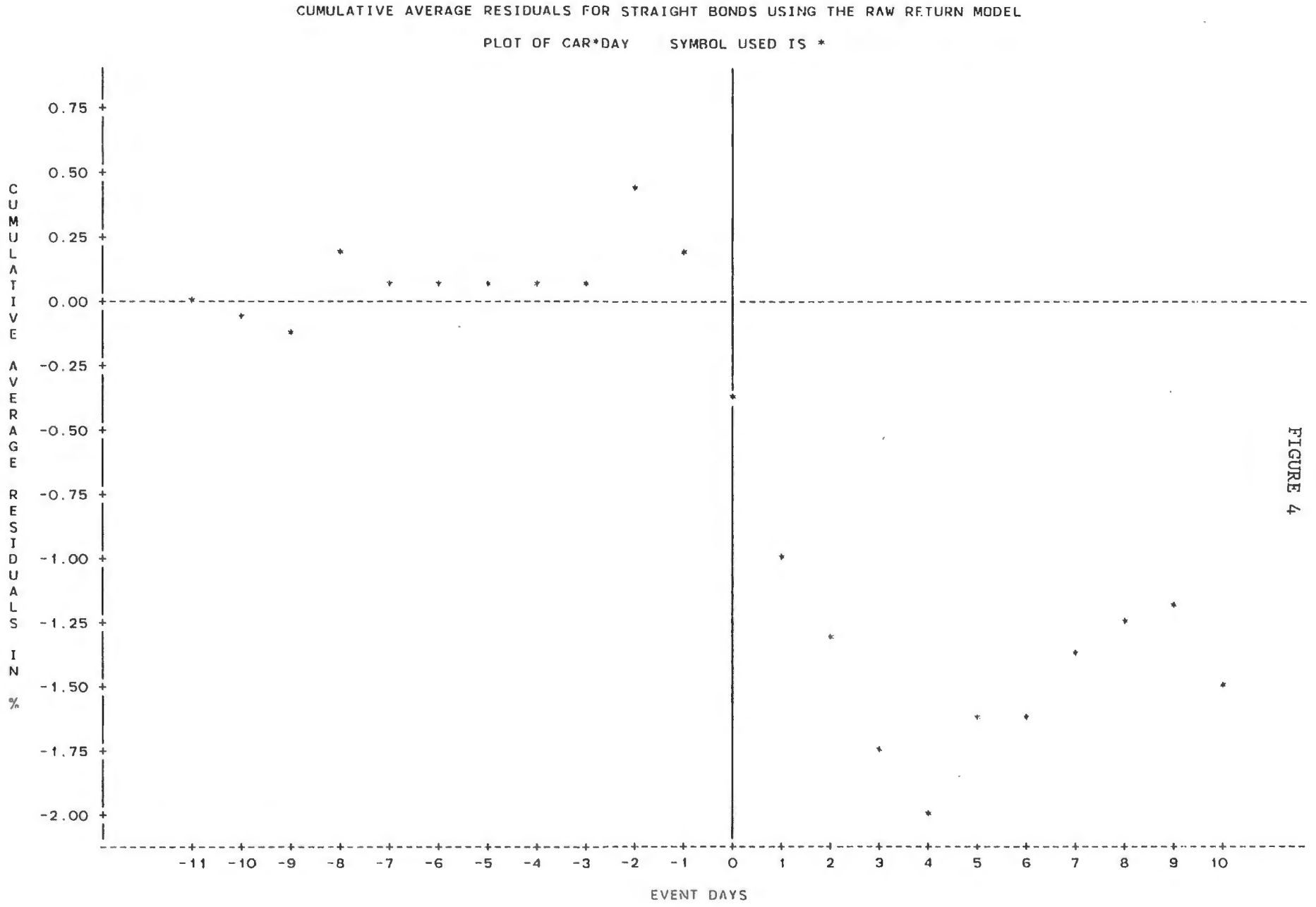
CUMULATIVE AVERAGE RESIDUALS FOR STRAIGHT BONDS USING THE RAW RETURN MODEL
PLOT OF CAR*DAY SYMBOL USED IS *
CUMULATIVE AVERAGE RESIDUALS IN %
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
-1.25
-1.50
-1.75
-2.00
-11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
EVENT DAYS

FIGURE 4

CUMULATIVE AVERAGE RESIDUALS FOR STRAIGHT BONDS USING THE RAW RETURN MODEL

PLOT OF CASR*DAY SYMBOL USED IS *
PLOT OF CAMR*DAY SYMBOL USED IS +

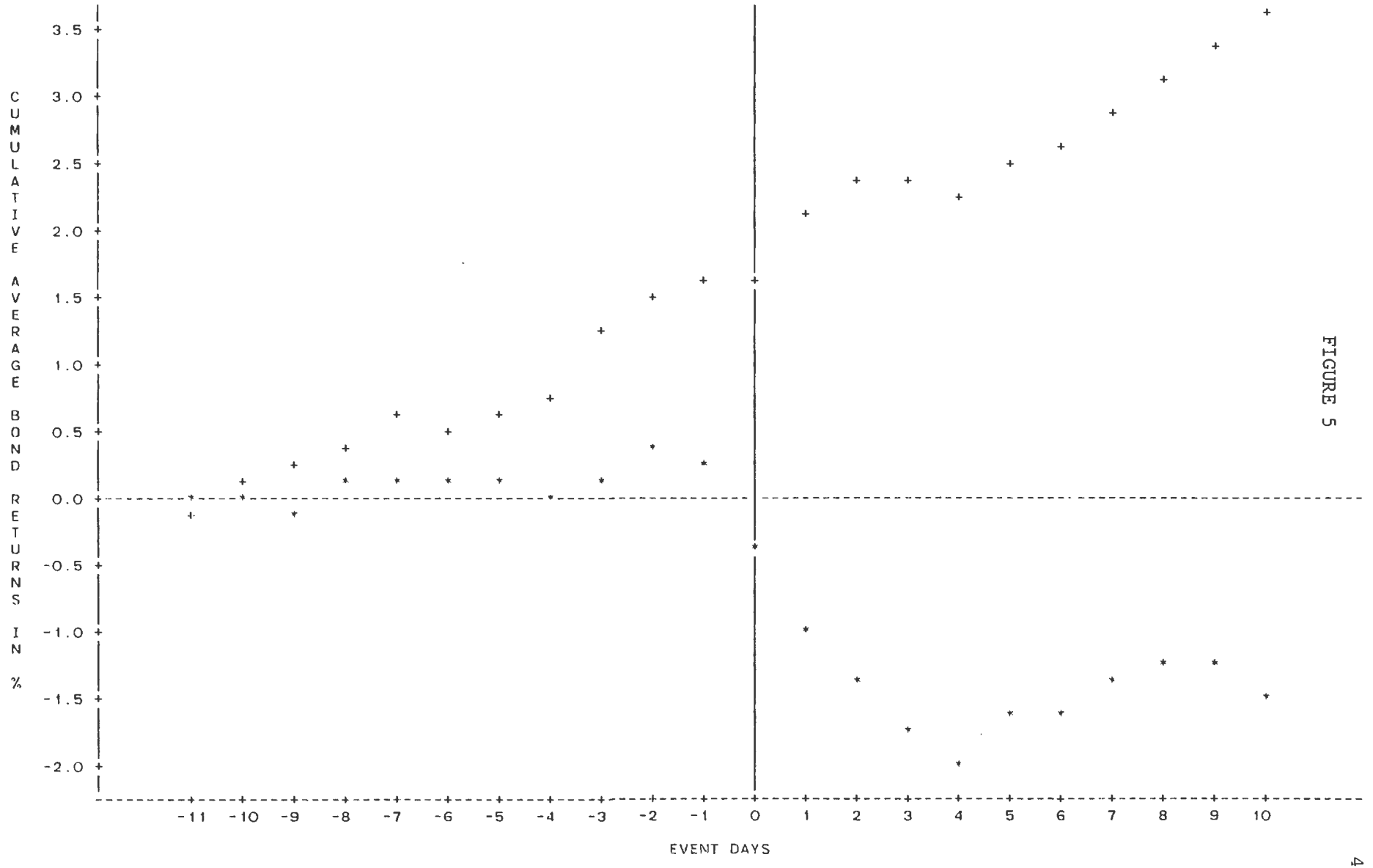

FIGURE 5

MAJOR CHARACTERSTICS OF THE SAMPLE (IN MILLIONS OF DOLLARS)

OBS	NAME	MKTVAL	TASST	REV	NI	CLB	LTDB	CLA	LTDA
1	CONT GRP INC	2750.0	3653.00	4819.50	199.2	.	.	.	.
2	RHEEM MFG CO	1251.0	.	.	.	.	.	.	.
3	METROMEDIA	1130.0	1310.00	532.70	102.1	237.000	653.000	.	.
4	WOMETCO ENT INC	977.4	.	519.60	30.8	89.900	166.000	.	.
5	ARA SER INC	882.5	1402.56	3056.50	53.6	411.374	310.119	462.000	1075.00
6	DR PEPPER	627.0	.	560.40	21.5	.	.	.	.
7	MALONE HYDE	580.0	467.95	2601.30	34.0	.	.	.	85.00
8	CONOCO	500.0	.	.	.	.	.	.	.
9	BLUE BELL INC	470.9	708.87	1228.90	47.5	288.600	73.000	.	.
10	ACF IND INC	468.7	1173.06	583.70	1.8	150.000	408.000	.	.
11	HARTE HANKS	457.0	485.16	443.60	33.3	62.400	141.000	78.967	738.93
12	AMSTAR	438.6	604.66	1191.10	22.3	109.000	44.500	125.000	43.00
13	CONE MILLS	385.0	.	687.70	8.7	137.000	4.870	.	.
14	KAISER STEEL	374.4	1057.40	734.90	2.6	234.754	102.972	117.956	75.07
15	BROOKS FASH	368.3	90.55	336.30	23.5	.	.	.	.
16	COLE NATNL CORP	312.4	300.30	617.20	17.6	.	.	.	.
17	TICOR	271.3	.	533.70	12.4	.	88.200	.	65.50
18	STORER COMN	1496.7	1242.24	536.80	-16.7	134.994	785.095	134.000	626.00
19	NORTHWEST IND	1158.5	1525.20	1431.90	77.5	270.500	418.800	.	.
20	SFN COS INC	424.5	328.40	324.10	28.7	142.000	289.000	390.000	417.00
21	LEVITZ FURN	318.1	46.88	644.40	27.4	13.504	7.162	.	.
22	GUARDIAN IND	300.0	502.56	464.80	38.1	84.100	121.000	69.700	468.00
23	SCOTT FETZER	500.0	468.08	629.50	32.2	173.726	33.333	.	.
24	NATL MED CARE	351.6	1883.00	.	.	.	.	.	.
25	ROYAL CROWN	237.1	251.44	490.06	14.9	.	.	.	.
26	RAYMOND INTL	165.0	.	.	.	.	.	.	.
27	DILLINGHAM CORP	350.0	.	1487.30	20.9	293.000	100.000	.	.
28	LYKES BRS SS CO	150.0	.	413.00	.	.	.	.	.
29	CCI CORP	100.0	.	336.60	19.2	34.100	47.500	35.600	107.00
30	DORCHESTER GAS	391.5	525.31	.	.	130.439	44.776	.	.
31	ALBANY INTL	270.4	.	332.60	16.2	46.000	57.600	.	.
32	TI-CARO	190.8	196.52	.	.	35.395	20.680	.	.
33	DAN RIVER INC	129.6	.	.	.	.	.	.	.

SIMPLE UNIVARIATE STATISTIC FOR ALL VARIABLES IN DATASET

VARIABLE	LABEL	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM
MKTVAL	MARKET VALUE OF BUYOUT	38	563.3631579	492.5746421	100.0000000	2750.000000	79.9061585	21407.80000
TASST	TOTAL ASSETS OF BOUGHT COMPANY	23	884.8310435	794.2245464	46.8810000	3653.000000	165.6072659	20351.11400
REV	REVENUES OF BOUGHT COMPANY	28	1025.5128571	1017.3830348	324.1000000	4819.500000	192.2673213	28714.36000
NI	NET INCOME OF BOUGHT COMPANY	27	36.5407407	40.9765811	-16.7000000	199.200000	7.8859467	986.60000
CLB	CURRENT LIAB BEFORE BUYOUT	22	164.2175455	115.6854024	13.5040000	419.000000	24.6642107	3612.78600
LTDB	LONG TERM DEBT BEFORE BUYOUT	23	189.0113913	207.4415853	4.8700000	785.095000	43.2545606	4347.26200
CLA	CURRENT LIABILITIES AFTER BUYOUT	8	176.6528750	158.4523133	35.6000000	462.000000	56.0213526	1413.22300
LTDA	LONG TERM DEBT AFTER BUYOUT	10	370.0500000	357.0730200	43.0000000	1075.000000	112.9164034	3700.50000

APPENDIX B

MAJOR CHARACTERSTICS OF THE FIRMS IN THE SAMPLE

OBS	NAME	CUSIP	IPERM	ADATE	DLDATE
1	CONT GRP INC	21145210	11447	07-02-84	11-02-84
2	RHEEM MFG CO	76203390	21813	08-24-84	11-14-68
3	METROMEDIA	59169010	28580	02-01-84	06-22-84
4	WOMETCO ENT INC	97816510	42227	03-30-84	04-13-84
5	ARA SER INC	00204010	39271	07-13-84	12-20-84
6	DR PEPPER	25612910	22648	11-18-83	02-29-84
7	MALONE HYDE	56128010	52441	06-12-84	07-13-84
8	CONOCO	20825110	11471	10-19-83	10-01-81
9	BLUE BELL INC	09529310	44273	07-25-84	11-28-84
10	ACF IND INC	00080010	10006	04-18-84	06-29-84
11	HARTE HANKS	41619410	56389	03-28-84	09-12-84
12	AMSTAR	03217210	10479	09-29-83	02-09-84
13	CONE MILLS	20681310	24707	11-29-83	03-28-84
14	KAISER STEEL	48309810	59758	10-03-83	03-01-84
15	BROOKS FASH	11439410	65517	08-07-84	11-01-84
16	COLE NATNL CORP	19328810	43000	06-05-84	09-18-84
17	TICOR	88634810	49760	10-03-83	07-30-79
18	STORER COMN	86213110	25611	05-06-85	12-06-85
19	NORTHWEST IND	66752810	21995	04-10-85	08-01-85
20	SFN COS INC	78415010	40723	10-02-84	02-04-85
21	LEVITZ FURN	52748020	47335	04-04-84	04-11-84
22	GUARDIAN IND	40137010	48880	08-22-84	02-22-85
23	SCOTT FETZER	80936710	46543	04-16-84	********
24	NATL MED CARE	63688210	58456	08-07-84	12-21-84
25	ROYAL CROWN	78024010	21303	02-17-84	07-02-84
26	RAYMOND INTL	75472110	27406	05-06-83	11-17-83
27	DILLINGHAM CORP	25411110	45989	01-10-83	03-18-83
28	LYKES BRS SS CO	55089010	26569	11-15-82	12-06-78
29	CCI CORP	12488410	30074	11-16-82	01-21-83
30	DORCHESTER GAS	25819810	61110	01-26-84	08-24-84
31	ALBANY INTL	01234710	57998	04-14-83	08-04-83
32	TI-CARO	88629610	61874	01-26-84	05-07-84
33	DAN RIVER INC	23577310	25689	01-05-83	05-25-83

CUSIP CUSIP numer of company on the CRSP tape
IPERM IPERM number of company on the CRSP tape
ADATE The announcement date of the LBO offer
DLDATE The delisting date of the company on the NYSE or ASE
******** Company trading on NYSE or ASE as of December 31, 1985

VITA

Ashu Jain

Candidate for the Degree of

MASTER OF BUSINESS ADMINISTRATION

Thesis: THE EFFECT OF LEVERAGED BUYOUTS ON SECURITY HOLDERS

Major Field: Finance

Biographical:

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Educaton: Graduated from St. Mary's Academy, Meerut, India on May 1980, received the Indian School Certificate; graduated from St. Stephen's College, New Delhi, India in May 1984; received the Bachelor of Arts degree from Delhi University; completed requirements for the Master of Business Administration degree at Oklahoma State University, Stillwater, Oklahoma, December 1986.